Networked Radar System to Increase Safety of Urban Railroad Crossing

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***Abstract*—** A big challenge in transport systems is to increase the safety of railway level crossing, particularly in urban scenarios.

In railway level crossing, automatic control systems have been massively introduced to cut the cost of having people for the surveillance of each railroad crossing. However severe incidents can occur due to: i) a fault in the automatic system closing/opening the level crossing; ii) a fault in the automatic system signaling the transit of trains; iii) the incorrect behavior of pedestrians, drivers, bikers and so on that get trapped in the crossing thus representing an obstacle for the incoming train. Severe accidents often occur in case the railway is crossing at the same level a road in urban scenarios, particularly in big cities with a chaotic traffic of cars, two- or three-wheeled vehicles (motorcycle, bike, rickshaw.....), pedestrians,...

At physical level this scenario is complicated by the fact that the Railroad crossing control system should work in severe environmental and light conditions, night and day, with a high Safety Integrity Level (SIL).

To address this issue in this paper we proposed, designed and tested a networked system composed of 2 Radar sensing nodes and 1 master processing node, interconnected also with the national railway information/signaling system, for the safe control of each level crossing.

***Keywords*—** Radar for safe mobility, Railway, Railroad Crossing, Transport Safety

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